E-Infrastructures and Technologies for Lifelong Learning:

Next Generation Environments

George Magoulas
University of London, UK

Information Science
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Published in the United States of America by
Information Science Reference (an imprint of IGI Global)
701 E. Chocolate Avenue
Hershey PA 17033
Tel: 717-533-8845
Fax: 717-533-8661
E-mail: cust@igi-global.com
Web site: http://www.igi-global.com/reference

Library of Congress Cataloging-in-Publication Data

E-infrastructures and technologies for lifelong learning: next generation environments / George Magoulas, editor.
p. cm.
Includes bibliographical references and index.
Summary: “This book provides a comprehensive review of state-of-the-art technologies for e-learning and lifelong learning, examining theoretical approaches, models, architectures, systems and applications”-- Provided by publisher.
ISBN 978-1-61520-983-5 (hardcover) -- ISBN 978-1-61520-984-2 (ebook) 1. Continuing education--Technological innovations. 2. Continuing education--Computer-assisted instruction. I. Magoulas, George D.
LC5225.D38E3 2011
374’.2--dc22
2011007463

British Cataloguing in Publication Data
A Cataloguing in Publication record for this book is available from the British Library.

Chapter 12
Learning, Unlearning, and Relearning:
Using Web 2.0 Technologies to Support the Development of Lifelong Learning Skills

Joanna C. Dunlap
University of Colorado Denver, USA

Patrick R. Lowenthal
University of Colorado Denver, USA

ABSTRACT

Given ever-changing societal and professional demands, lifelong learning is recognized as a critical educational goal. With postsecondary students' increased demand for online learning opportunities and programs, postsecondary educators face the challenge of preparing students to be lifelong contributing members of professional communities of practice online and at a distance. The emergence of powerful Web 2.0 technologies and tools have the potential to support educators' instructional goals and objectives associated with students' professional preparation and the development of lifelong learning skills and dispositions. In this chapter, the authors explain how postsecondary educators can use the Web 2.0 technologies associated with blogging, social networking, document co-creation, and resource sharing to create intrinsically motivating learning opportunities that have the potential to help students develop the skills and dispositions needed to be effective lifelong learners.

DOI: 10.4018/978-1-61520-983-5.ch012

INTRODUCTION

The world we live in is changing right before our eyes, as well-illustrated by Dr. Michael Wesch's thought-provoking YouTube video, "A Vision of Students Today" (http://www.youtube.com/watch?v=dGCJ46vyR9o). One basic point made in this video is that information and communication technologies are drastically changing the world we live in, and institutions of higher education are now scrambling to attend to these changes. Specifically, universities are trying to adequately respond to a trifecta of emerging trends:

- Today's economy depends increasingly on employees who are quick and efficient lifelong learners (Hinrichs, 2004). Employers are now looking for employees who can think critically and solve a range of problems, move easily from one task to another, work efficiently and effectively in team situations, and constantly adjust and enhance their knowledge and skills to meet ever-changing needs (Casner-Lotto & Barrington, 2006; Dunlap, 2005).
- Postsecondary education has been involved in a paradigm shift from teacher-centered learning to student-centered learning (Barr & Tagg, 1995; Boggs, 1999; Harden, 2000). This shift substitutes teacher-centered learning's goal of providing instruction through transfer of knowledge with student-centered learning's goal of producing learning through student discovery and construction of knowledge (Barr & Tagg, 1995). Universities have been encouraged to focus their strategies and resources on this paradigm shift in an effort to make learning more meaningful and lasting for students.
- The postsecondary audience is demanding more distance and online learning opportunities (Grabinger & Dunlap, 2004; Ludwig-Hardman & Dunlap, 2003). This demand is no longer based solely on geographic obstacles and schedule constraints; many students report a preference to the online learning format for a variety of reasons. For example, some students perceive on-campus course experiences as high-pressure, uncomfortable, and even exclusionary because of cultural differences, social class background, lack of facility with the English language, age, and so on (Burbules & Callister, 2000a). Additionally, because these students typically have full lives and busy schedules with which to contend, they want what they want, when they want it: (1) students expect their learning opportunities to be available immediately, and (2) students need learning experiences that are directly applicable to their needs and immediately transferable to their professional settings (Grabinger & Dunlap, 2004).

Reflecting and in response to these specific trends, lifelong learning is increasingly recognized as a critical educational goal. Lifelong learning is intentional learning that people engage in throughout their lives for personal and professional fulfillment to improve the quality of their lives (Dunlap & Grabinger, 2003). The emergence of Web 2.0 technologies, and the participatory culture those technologies engender, has great potential to support lifelong learning endeavors, allowing for informal, just-in-time, day-to-day learning. Unfortunately, people are often ill-equipped to engage in lifelong learning (Dunlap, 2005), let alone take full advantage of the abundance of resources available at their fingertips via Web 2.0 technologies.

We believe that postsecondary educators preparing students for professions in this day and age are obligated to help students develop into competent lifelong learners. In this chapter, we will describe and present examples of how online technologies are making just-in-time, at-your-fingertips lifelong learning a possibility.

More specifically, we will focus on how Web 2.0 technologies such as blogging (e.g., using tools like Blogger or WordPress), microblogging/microsharing (e.g., Twitter), social networking (e.g., Facebook, MySpace, Ning), document co-creation (e.g., Google Docs), and resource sharing (e.g., Flickr, Slideshare, Diigo) can be used by post-secondary educators to help students develop as lifelong learners.

CHARACTERISTICS OF LIFELONG LEARNERS

Long before there was a Web 2.0, Alvin Toffler, author of *Future Shock* and *The Third Wave*, foresaw the importance of lifelong learning and broadening our conception of what makes a person literate. Toffler, by quoting Herbert Gerjuoy, argued that,

"The new education must teach the individual how to classify and reclassify information, how to evaluate its veracity, how to change categories when necessary, how to move from the concrete to the abstract and back, how to look at problems from a new direction—how to teach himself. Tomorrow's illiterate will not be the man who can't read; he will be the man who has not learned how to learn." (1973, p. 414)

Toffler was basically suggesting, what many of us are coming to find out today, that the illiterate of the 21st century will be those who cannot learn, unlearn, and relearn—in other words, those who lack lifelong learning skills and dispositions.

Lifelong learners embody specific characteristics that empower them to learn, unlearn, and relearn. They are able to learn and adapt because they reflect on the quality of their understanding and seek to go beyond what they know (Dunlap, 2005). This requires a love of learning and willingness to engage in learning—in other words, a disposition toward lifelong learning. This disposition includes characteristics, such as risk taking (Brookfield, 1985/1991), intellectual curiosity (Dunlap & Grabinger, 2003), persistence (Grow, 1991), taking responsibility for decisions related to learning (Candy, 1991), and viewing learning as an ongoing process (Dunlap & Grabinger, 2003); it also includes a specific skill set: the capacity for self-directed learning supported by metacognitive awareness (Dunlap & Grabinger, 2003; Dunlap, 2005). Unfortunately, many students struggle with online learning because they do not possess the necessary self-directed learning and metacogntive-awareness skill set: self-discipline, the ability to work alone, time management, learning independently, the ability to develop a plan for completing work, and so on (Burak, 1993; Dunlap & Grabinger, 2003; Hancock, 1993; Ludwig-Hardman & Dunlap, 2003). Coincidently, this is the very skill set needed for lifelong learning.

Self-Directed Learning

Self-directed learning is crucial for lifelong learning (Dunlap, 2005; Dunlap & Grabinger, 2003; McFarlane & Dunlap, 2001). According to Malcolm Knowles (1975), one of the first scholars to seriously focus on the concept of self-directed learning, self-directed learning is:

The process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing learning strategies, and evaluating learning outcomes. (p. 18)

Although often described as a hallmark of adulthood, a lot of people are not self-directed learners (Kerka, 1994). Yet, most guidelines and assessment tools that describe successful online learners list self-direction as a primary quality of successful online students (Ludwig-Hardman &

Dunlap, 2003); in fact, many universities provide criteria to potential students so they can self-assess if online education is for them, such as:

- University of Illinois's website asks, "Do you have self-discipline and motivation?" (http://www.online.uillinois.edu/students/well_suited.asp)
- The Minnesota State Colleges and Universities System notes, "Online learning is often accelerated and requires that you are motivated and can work independently" (http://www.mnonline.org/started/rightforyou.html)
- The College of Nursing at University of North Carolina Chapel Hill lists self-motivation, self-direction, self-discipline, and initiative as the first four skills of successful online learners (http://nursing.unc.edu/current/rn-bsn/program/)
- Colorado State University shares, "If you are an independent learner, self-motivated, and interested in accelerating your course of study, online learning may be appropriate for you." (http://www.learn.colostate.edu/answers/faq/index.dot?tag=Online+Learning&tagCount=11#online_right)

As these assessment tools illustrate, there is a clear expectation in distance and online learning programs that require students to take on a high level of responsibility and initiative for their own learning (McLoughlin & Marshall, 2000). Therefore, to be successful online students, students need the skills required for effective online learning, and those skills need to be explicitly taught and supported in the online learning environment.

Self-directed learning focuses on how students internally and psychologically control their own learning (Candy, 1991; Hancock; 1993; Long, 1989; Overly, McQuigg, Silvermail, &Coppedge, 1980). Some ways that students accomplish this is through (Barrows, 1985; Burak, 1993; Hancock, 1993):

- Identifying and defining a problem or learning need;
- Establishing goals and objectives for addressing the problem or learning need;
- Developing action plans and timelines to guide learning activities;
- Identifying, finding, using, and critiquing resources for solving the problem or meeting the learning requirement;
- Capturing and applying information from resources to the problem or learning need; and
- Critiquing information, skills, and processes used to solve problems or meet learning requirements.

A common misconception though about self-directed learning is that it happens alone; self-directed learning, however, does not mean learning in isolation (Brookfield, 1985/1991). Self-directed learners—in addition to using direct instruction, print materials, and technology-delivered materials—take advantage of a variety of human-oriented resources including peers and colleagues, teams, informal and formal social networks, and communities of practice (Kerka, 1994). However, self-directed learning is not enough: to truly be able to learn, unlearn, and relearn, students must be metacognitively aware (Dunlap, 2005; Dunlap & Grabinger, 2003).

Metacogntive Awareness

Students must possess metacognitive awareness if they wish to become effective lifelong learners who are able to learn, unlearn, and relearn in the 21st century (Dunlap, 2005; Dunlap & Grabinger, 2003). Metacognition is essentially the learner's knowledge and regulation of cognitive process. More specifically, metacognition, according to Biggs and Moore (1993), is the "awareness of one's own cognitive process rather than the content of those processes together with the use of

that self-awareness in controlling and improving cognitive processes" (p. 527).

Metacognitive awareness is important for a number of reasons. Learners who are metacognitively aware perform the following activities (Brockett & Hiemstra, 1985; Brookfield, 1985/1991; Glaser, 1984; Ridley, Schultz, Glanz, & Weinstein, 1992; Von Wright, 1992):

- Take conscious control of learning;
- Plan and select learning strategies;
- Monitor and evaluate effectiveness of learning strategies through self-assessment and review;
- Adjust learning behaviors, processes, and strategies; and
- Reflect on learning.

People with well-developed metacognitive skills engage in effective problem solving and reasoning activities (Bereiter & Scardamalia, 1985; Bransford et al., 1986; Chi, Feltovich, & Glaser, 1981). On the other hand, people with poorly developed metacognitive skills have difficulty recognizing when they have failed to adequately meet learning goals or complete tasks (Bransford, Sherwood, Vye, &Rieser, 1986). Therefore, the capacity for self-directed learning supported by metacognitive awareness is key to effective lifelong learning. This is especially true today, given frequently changing professional needs and demands and the explosion of information and technologies; one cannot effectively use Web 2.0 technologies, let alone engage in lifelong learning, without the capacity for self-directed learning supported by metacognitive awareness.

STRATEGIES FOR USING WEB 2.0 TECHNOLOGIES FOR LIFELONG LEARNING

In order to prepare students for lifelong learning, educators must provide students with educational opportunities to develop their capacity for self-direction, metacognitive awareness, and an overall disposition toward lifelong learning (Dunlap, 2005). To determine what teaching strategies help students develop as lifelong learners, Dunlap and Grabinger (2003) investigated well-established instructional approaches, such as problem-based learning, that appear—based on foundational theory and empirical research—to enhance students' lifelong learning skills and dispositions. They concluded that educators can support students' lifelong-learning development by attending to five specific instructional objectives when designing courses and other educational opportunities:

- Develop student autonomy, responsibility, and intentionality;
- Encourage reflection;
- Enculturate into a community of practice;
- Encourage discourse and collaboration; and
- Provide intrinsically motivating learning activities.

While there are many ways that educators can attend to each of these instructional objectives, a number of new online Web 2.0 technologies—many of which students are already using (Greenhow, Robelia, & Hughes, 2009; Lenhart, Madden, Macgill, & Smith, 2007; Madden & Fox, 2006)—can be used to attend to these specific instructional objectives in new and creative ways and as a result help to develop lifelong learning skills (i.e., self-directed learning and metacognitive awareness skills) in students.

The term Web 2.0 was originally coined by DiNucci (1999) and later popularized by Dougherty and O'Reilly (see O'Reilly, 2005a, 2005b) to describe how the Web is changing from a read-only web to a read-and-write web that facilitates participatory, collaborative, and distributed practices (Antonelli, 2009; Downes, 2005; Greenhow, Robelia, & Hughes, 2009). Therefore, Web 2.0 is more than just new technology; according to

Greenhow et al., Web 2.0 "is both a platform on which innovative technologies have been built and a space where users are as important as the content they upload and share with others" (p. 347). These technologies coupled with the participatory and distributed practices they engender are changing the way people learn (Greenhow et al.) and some even argue are challenging universities to rethink how they do business (Barnes & Tynan, 2007). We have found that Web 2.0 technologies help make just-in-time, at-your-fingertips lifelong learning possible in ways that typical learning management systems (LMS)—with their highly bounded, asynchronous, threaded, and removed-from-professional-context structure—cannot. As a result, we are continually exploring ways that we can integrate these online technologies into our courses. In the following paragraphs, we describe how a few of these Web 2.0 technologies—namely, blogs, social networks, online document creation, and resource sharing—can be used to help students develop lifelong learning skills and dispositions by attending to the specific instructional objectives presented above.

Blogging to Encourage Student Intentionality and Reflection

As educators, we need to strive to help students become intentional and reflective learners if they are to engage in lifelong learning. Intentional students are self-directed and possess metacognitive awareness. Purposeful, effortful, and active (Palincsar & Klenk, 1992), these students are autonomous, responsible learners who focus on understanding and performance rather than the accumulation of decontextualized facts (Bereiter & Scardamalia, 1989). We can promote the development of autonomy and responsibility by encouraging students to (Dunlap & Grabinger, 2003):

- Assess what they know and do not know about a topic;
- Set specific goals and objectives for their learning;
- Ask both knowledge and wonderment questions to focus learning on goals and objectives;
- Create plans for achieving their goals and objectives;
- Set a time line for achieving their learning goals; and
- Identify resources that they may use while studying.

Related, reflective students have the ability to think about themselves as intentional subjects of personal actions, and consider the consequences and efficacy of those actions (Von Wright, 1992). Students need to have opportunities to examine their methods and options in order to develop the skills needed for lifelong learning. Blakely and Spence (1990) describe several basic reflective strategies for developing metacognitive awareness and self-directed learning skills:

- Ask students to consciously identify what they "know" as opposed to "what they don't know";
- Use journals or logs to help students reflect upon their learning processes;
- Engage students in guided self-evaluation through individual conferences and check-lists to help them focus on their thinking processes;
- Utilize collaborative activities to enable students to test and challenge each other's knowledge; and
- Involve students in think-aloud, role-play and structured walkthrough activities that encourage them to describe their thinking, learning, decision-making, and processes.

One Web 2.0 technology that can be used to support the development of student intentionality and reflection is blogging. Blogs are web-based journals in the form of frequent, chronological

publications of thoughts and ideas, typically within a specific theme or area of interest; they can be set up as public or private and can enable commenting. The most popular blogging applications are WordPress and Blogger. It has been estimated that in early 2008, there were over 110 million blogs (Richardson, 2008).

Over the past few years, blogs have received positive attention from educators (e.g., Downes, 2004; Dunlap, 2008; Richardson, 2008; Warlick, 2007) for their ability to promote literacy, collaboration, and participation. At the same time, though, others like Keen (2008) have criticized blogs and the new read-and-write web for encouraging a "Cult of Amateurs". Keen, while a bit extreme, seems to suggest that blogs are,

collectively corrupting and confusing popular opinion about everything from politics, to commerce, to arts and culture. Blogs have become so dizzyingly infinite that they've undermined our sense of what is true and what is false, what is real and what is imaginary. These days, kids can't tell the difference between credible news by objective professional journalists and what they read on joeshmoe.blogspot.com. For these Generation Y utopians, every posting is just another person's version of the truth; every fiction is just another person's version of the facts. (p. 3)

Thus, while some see the value in creating a "society of authorship" (as cited in Richardson, 2008), others like Keen are quick to point out potential pitfalls of flattening our world and enabling any "amateur" the ability to read/write and publish what he or she thinks. Similarly, Bauerlein (2008) argues that "for most young users, it is clear, the Web hasn't made them better writers and readers, sharper interpreters and more discerning critics, more knowledgeable citizens and tasteful consumers" (p. 110).

However, we, like a growing number of educators, see the potential educational value of blogs and blogging, specifically as it relates to encouraging students to be intentional and reflective learners. In our experience, in order to create and maintain a blog, students need to identify and define a focus for their blog; establish goals and objectives for how and when they will contribute to their blog; identify, find, use, and critique content and ideas to include in their blog; appropriately share content and ideas to an audience via their blog; and critique the effectiveness of their blog posts to meet their goals and objectives for their blog and the needs of their audience (Dunlap, 2008; Dunlap & Stevens, 2009). These activities are directly related to self-directed learning and metacognitive skills, serving to help students develop those skills for lifelong learning (Dunlap, 2005; Dunlap & Grabinger, 2003).

In addition, having students maintain their own blogs is an effective way of engaging them in intentional, reflective practice, accomplishing several objectives related to students' development as lifelong learners:

- It requires students to articulate their ideas and perspectives, encouraging them to be brave and bold about their contributions to the greater discourse.
- It engages students in reflection on the domain, requiring them to critically analyze ideas, perspectives, theories, research, and designs. It makes their thinking visible, and this public context encourages a unique caliber of thoughtfulness that does not typically happen in private journals.
- It reminds students that they are contributing members of a professional community, using their blogs as (1) vehicles for idea dissemination, (2) avenues for garnering feedback from peers and colleagues, and (3) opportunities for collaboration with peers and colleagues. It helps them establish themselves as knowledgeable practi-

tioners, and develop positive professional reputations.
- It helps students express themselves in professional and articulate ways. It also requires them to make time for writing, organize their writing, and develop a habit of writing.
- It helps students develop the skills and dispositions needed to use technology in support of self-expression, inquiry, knowledge construction, and collaboration; and, of course, use these technologies to support lifelong learning endeavors.

In our graduate program, students use blogs as academic and professional portfolios. Via their blogs, our students present their work (e.g., presentations, instructional materials, podcasts, videos, design documents, and research reports); write opinion pieces and summaries of readings; build repositories of design ideas and resources; and archive coursework and course materials. Their blogs are public, and therefore are accessed by the local community (e.g., faculty, students, and alumni of the program) and the professional community of practice. The activity of public sharing and professional contribution that occurs with their blogging involves students in reflective activities—such as goal setting, identifying valuable learning resources, self-evaluation, and collaboration—that support the development of their self-directed learning skills and metacognitive awareness for lifelong learning (Dunlap, 2005; Dunlap & Grabinger, 2003).

Blogging is one way to promote lifelong learning through the development of self-directed learning skills and metacognitive awareness. Microsharing and social networking are other legitimate—and arguably often overlooked—strategies that can support the development of students' lifelong learning skills and dispositions.

Enculturating Students through Microsharing and Social Networking

Learning—and, therefore, lifelong learning—is a social process that is situated in a context (Brown, Collins, &Duguid, 1989; Lave & Wenger, 1991). When learning activities are contextually situated, students participate in the authentic culture of the discipline they are studying—using the physical and mental tools of the discipline. In order for students to use the "physical and mental tools of the discipline" they must develop their self-directed learning skills and metacognitive awareness. Brown, Collins, and Duguid (1989) explain that "to learn to use tools as practitioners use them, a student, like an apprentice, must enter that community and its culture. Thus, in a significant way, learning is…a process of enculturation" (p. 3). The process of enculturation—and becoming effective self-directed, metacognitively-aware learners that can grow and thrive in, and contribute to, the discipline—becomes especially important in postsecondary programs. For postsecondary programs that aim to prepare students to work in a specific discipline—and for the culture that the discipline is situated in—students need to learn not only "about" a field of study but also how "to be" a full participant in a particular field (Brown & Adler, 2008). Educators can reinforce and encourage enculturation—participation in a legitimate community of practice as self-directed, metacognitively-aware learners—through:

- Practice with cultural exemplars including solving authentic problems, putting knowledge they acquire to use, and transferring knowledge and skills to new problems (Dunlap, 2006, 2008; Dunlap & Grabinger, 1996; Tishman, Jay, & Perkins, 1993);
- Cultural interactions where students assume the roles of members of a community of practice in solving the problem and engaging in the culture's thinking and processes (Brown, Collins, & Duguid, 1989;

Dunlap, 2006; Lave & Wenger, 1991; Stepien & Gallagher, 1993); and

- Direct instruction in cultural knowledge and activities where students engage in leading, recording, discussing, facilitating, making decisions, collaborating, confronting misconceptions and ineffective strategies, making presentations, and evaluating the learning activity (Brown, Collins, & Duguid, 1989).

The National Research Council's prominent study on "How People Learn" (Bransford, Brown, & Cocking, 2000) calls for students to be connected to outside practitioners and professional communities of practice in ways that allow for feedback, reflection, and revision opportunities—in other words, it recommends that educators find opportunities to enculturate students into professional communities of practice. The Web is a great source for opportunities to develop students' self-directed learning skills and metacognitive awareness within a discipline while connecting them with communities of practice (Dunlap & Lowenthal, 2009b). Two categories of Web 2.0 technologies that are particularly useful when it comes to enculturating students into a community of practice and, therefore, developing self-directed learning skills and metacognitive awareness for lifelong learning are microsharing tools such as Twitter and social networking tools such as Facebook, MySpace, and Ning.

Twitter

Twitter (http://www.twitter.com) is a multiplatform Web 2.0, part social networking—part microblogging tool, freely accessibly on the Web (Stevens, 2008) with an estimated 18 million users (Ostrow, 2009). Twitter's website describes Twitters as, "a service for friends, family, and co–workers to communicate and stay connected through the exchange of quick, frequent messages." In 140 characters or less, people who participate in the Twitter community share ideas and resources, ask and answer questions, and collaborate on problems of practice; in a recent study, researchers found that the main communication intentions of people participating in Twitter could be categorized as daily chatter, conversations, sharing resources/URLs, and reporting news (Java et al., 2007).

Twitter community members post their contributions to Twitter via the Twitter website, mobile phone, email, and/or a Twitter client like Twirl—making it a powerful, convenient, community-controlled microsharing environment (Drapeau, 2009). Depending on whom you choose to follow (i.e., communicate with) and who chooses to follow you, Twitter can be effectively used for professional and social networking (Drapeau, 2009; Thompson, 2007) because it can connect people with like interests (Lucky, 2009). This becomes especially important for students because by following other professionals in their field on Twitter, they can begin to see how professionals in their field interact (Dunlap & Lowenthal, 2009a, 2009b) and, therefore, slowly become enculturated in the professional community they are entering. Besides the networking potential, students can also receive immediate feedback on their questions and ideas from practicing professionals on Twitter (Dunlap & Lowenthal, 2009a, 2009b), which serves to enhance their learning and their enculturation into their professional community of practice.

In our university courses, we invite students to participate in Twitter with us. Our initial reason for adopting Twitter as an instructional tool was because we wanted to have an informal, just-in-time way for our online students to connect with each other and with us throughout the day. We have an overarching interest in enhancing social presence in online learning experiences (Dunlap & Lowenthal, 2009b, 2010a, 2010b; Lowenthal & Dunlap, 2010; Lowenthal, 2009; Lowenthal & Parscal, 2008), and have found that we cannot accomplish all we want to accomplish in terms of

social presence within the structure of a learning management system (LMS).

What has consistently been lacking when we rely on the LMS only is the informal, playful banter and chit-chat that we have with students in our on-campus courses. This banter helps students connect with us and experience our personalities. Also, it helps them connect with each other and us in a more natural, immediate way; when relying on an LMS for all student communication, the delay involved in logging in, accessing the correct course, locating the appropriate forum, posting a comment or question, and then continuing to monitor the forum while waiting for a response leads to a formal, less-than-immediate exchange of information. We determined to use Twitter, therefore, because it had the potential to promote the informal interaction we desired. However, we quickly discovered that Twitter was also able to engage students in a professional community of practice—connecting them to practitioners, experts, and colleagues—that served to enculturate them into the community (Dunlap & Lowenthal, 2009b). For example, our students experienced these types of interactions in the Twitter community:

- A student has a question about the chapter on multimodal learning. She immediately tweets her question to the Twitter community, and gets three responses within ten minutes—two responses from classmates, and one from her professor. This leads to several subsequent posts, including comments from two practicing professionals.
- A student working on an assignment is wondering about embedding music into a presentation. He tweets a question and gets a response from his professor and a practicing professional. Both point the student to different resources that explain how to embed music and provide examples to deconstruct. Within a half hour, the student has embedded music in his presentation.
- A student finds a great video about storyboarding on YouTube and posts the URL to Twitter. Her find is retweeted three times because others also think the video is great and worth sharing.
- A student tweets that he just posted a new entry to his blog on how vision trumps all other senses during instruction and provides the URL. His classmates, as well as other practicing professionals, read his blog post. He receives three tweets thanking him for sharing his ideas.
- As part of a research project on legacy systems, a student poses a question to the Twitter community regarding the prevalent need for COBOL programmers. She receives responses from several IT professionals, some with links to helpful resources and contacts that can help her with research.

As illustrated by the examples above, students' participation in Twitter allowed them to practice with cultural exemplars, assume the roles of practicing members of the community of practice, and engage in direct instruction of cultural knowledge and activities—the very activities needed to develop lifelong learning skills and dispositions (Dunlap & Grabinger, 2003).

Facebook / MySpace / Ning

As popular as Twitter is, social networking sites like Facebook (http://www.facebook.com/), MySpace (http://www.myspace.com/), and Ning (http://www.ning.com/) have many more users and more visits to their sites each month (Goldman, 2009). [Note: Ning changed their pricing structure in 2010, which is likely to influence their popularity in the future.] For example, Facebook alone has an estimated 300 million users (Facebook, n.d.). These larger networks arguably have even more potential for lifelong learning than smaller networks like Twitter. Educators, though, need to

recognize the differences between these sites and the different ways that students might use these sites to learn, unlearn, and relearn (see Boyd 2009a, 2009b for an interesting discussion of the differences between MySpace and Facebook).

Social media researchers have differentiated between *friendship-driven* and *interest-driven* types of participation in social media and social networking sites (Ito et al., 2010). While social networking tools like Twitter and Facebook attract both types of participation, we have found in our experience that Twitter attracts more interest-driven participation than Facebook—which was originally designed for and, to some degree, continues to be used predominantly for friendship-driven types of participation. We see this changing though. Social networking sites like Facebook want to continue to attract and support both types of participation. Evidence of this can be seen in Facebook's evolution from a site that only college students joined, to their introduction of news feeds (see Boyd, 2008) and unique URLs (Price, 2009), to their public status updates—**à** la Twitter (Smith, 2009). Additionally, Ning has emerged as a more professionally-oriented social networking forum that allows various levels of moderation and monitoring to support both open and bounded learning communities, and is being adopted by educators as a "space for students to ask questions about common issues, vendor choices, favorite books, and instructional practices within a trusted, monitored community of peers and...faculty" (Summers, 2009, p. 50).

Even though online social networking tools like Facebook, MySpace, and Ning began as ways for friends to connect, they have morphed into spaces where students can easily connect with practicing professionals, in much the same way as Twitter. In fact, a growing number of people use 3rd party mash-up tools to post their Twitter updates automatically to their Facebook account and vice versa. One appealing aspect of sites like Facebook in particular—due in a large part to its overall popularity and millions of users (Wauters, 2009)—is that a growing number of organizations and professional associations have a presence on Facebook, MySpace, or Ning, and sometimes on all three. For example, in our domain, the Association for Educational Communications and Technology (357 members), the International Society for Technology in Education (3,419 members), the International Society for Performance Improvement (827 members), Sloan-C (1,114 members), the Association for the Advancement of Computing in Education (1,723 members), Educause Learning Initiative (1,373), and the American Society for Training and Development (1,913 members) all have a presence now on Facebook. Also, online social networks, like Facebook in particular, enable people to self-identify their profession and interest; again, in our domain, there is a Facebook group called "Instructional Designers" that has 988 members.

Although younger users were historically attracted to these sites, Facebook has seen a 276% growth in users 35-54 years of age (Corbett, 2009), with the other social networking sites reporting similar growth and demographic shifts. With the expansion of the social networking audience to include professional communities of practice, these social networking tools are increasingly becoming forums for professional networking, sharing, collaboration, and lifelong learning and, therefore, offer great potential for student enculturation into the reflective and lifelong learning practices of professionals.

While participating in online social networks like Twitter and Facebook, students can develop and practice self-directed learning and metacognitive awareness skills such as making claims, collecting evidence in support of their claims, and evaluating and responding to counterarguments from others in the network. If educators encourage the use of social networking tools for this type of knowledge-building activity, there is great potential for students to reflect on specific aspects of their learning and thinking processes, and consider the impact of opinion, bias, contro-

versy, debate, and negotiation on their thinking and learning (Glaser, 1991)—again, all skills needed to be effective lifelong learners. Additionally, participating in social networks can help students learn how to ask questions based on personal knowledge deficits and formulate learning goals to address those deficits. If students can learn to ask questions to guide their knowledge building, and are encouraged to do so—thus assuming more control and ownership over their learning activities (Scardamalia & Bereiter, 1991)—students are more likely to take ownership of learning activities, find personal relevance during learning activities, and cultivate a lifelong-learning disposition (Dunlap & Grabinger, 2003). These skills will also help students to be wiser consumers of online information, and—in general—more effective users of Web 2.0 technologies to support their lifelong learning.

Supporting Dialogue and Collaboration with Document Co-Creation and Resource Sharing Tools

Another key strategy to use when providing students opportunities to develop an overall disposition toward lifelong learning is to encourage dialogue and collaboration. Through dialogue and collaborative work, students experience and develop an appreciation for multiple perspectives; refine their knowledge through argumentation, structured controversy, and the sharing of ideas and perspectives; learn to use colleagues as resources; and are more willing to take on the risk required to tackle complex, ill-structured problems (Dunlap & Grabinger, 2003). Collaboration elevates thinking, learning, and problem solving to an observable status (Glaser, 1991; Von Wright, 1992), which then enables learners to receive feedback and to reflect on their learning, and cognitive and metacognitive processes; collaboration, therefore, helps students develop their metacognitive awareness so they can better engage in self-directed learning and, ultimately, lifelong learning. Educators can enable and promote dialogue and collaboration by involving students in:

- Problem analysis, hypothesis formulation, and solutions brainstorming;
- Debate and argumentation to test and challenge each other's knowledge and learning;
- Teaching each other;
- The negotiation of meaning;
- Small group problem solving and projects; and
- Peer evaluation and review.

Luckily, there are a number of Web 2.0 technologies that educators can use to support this sort of dialogue and collaboration, such as document co-creation tools (e.g., Google Docs) and resource sharing tools (e.g., Flickr, Slideshare, Diigo).

Document Co-Creation

Many of us have to collaborate and co-create products day-to-day in our jobs, often with people in different geographic locations. Collaboration and co-creation is no longer an option but more of an imperative in the world we live in today. Unfortunately, we often assume that students know how to collaborate and co-create, activities that require self-directed learning skills and metacognitive awareness; but in our experience many do not. In the past, to collaborate and co-create, we might begin with a meeting or two to discuss the project and brainstorm and then once we began to co-create, we would send different versions of a Microsoft Word document back and forth to our colleagues using track changes or the commenting tool. This should sound familiar. In fact, many people still work this way. However, this is often not the most effective or efficient way to collaborate and co-create—especially when more than two people are working on a project at the same time.

When it comes to co-creating documents in a different way, wikis—and the most popular wiki, Wikipedia—typically come to mind. According to Wikipedia (n.d.), "a wiki is a website that uses wiki software, allowing the easy creation and editing of any number of interlinked Web pages, using a simplified markup language or a WYSIWYG text editor, within the browser" (para 1). Wikis have grown in popularity (e.g, Wikipedia has nearly 11 million users (Wikipedia, n.d.)) because they enable anyone who sets up an account to co-create and add and delete to the document. Further, they typically have the functionality to enable contributors the ability to discuss and co-create as well as to track revisions. Today there are over 100 different types of wiki software/solutions to choose from (http://www.wikimatrix.org/). And while the popularity of wikis grow and organizations continue to use them for everything from technical support and project management (Majchrzak, Wagner, & Yates, 2006) to internal documentation (Angeles, 2004; Wallace, 2008), newer document co-creation tools like Google Docs provide learners with much more flexibility, control, and options to create and co-create documents. In fact, this very chapter was co-created using Google Docs.

Google Docs (http://docs.google.com) and other similar tools (e.g., Adobe Buzzword - http://buzzword.acrobat.com and Zoho - http://www.zoho.com) enable users to collaborate and co-create in ways that wikis or traditional word documents cannot. The Google Docs suite includes document, presentation, and spreadsheet applications similar to those in Microsoft Office, which enables people to collaborate and co-create on a number of different types of projects. Further, these projects can be kept private, or published on the Web and made public. The Google Docs suite also has a chat tool built into the application, which enables users to chat and co-create—and therefore dialogue and collaborate—in one space.

We often use Google Docs in our online courses to support students' document co-creation activities. One example of this use is students' co-creation of a Top-100 List of Design Guidelines, used to support their instructional-materials design work. Developed in Google Docs over the course of the semester, students contribute new design guidelines with supporting citations based on the coursework and readings. By the end of the semester, students walk away with a robust set of design guidelines summarizing the readings that can be used as they continue their design work outside of the course. Google Docs makes it possible for our online postsecondary students to collectively develop a unique document, each sharing expertise, reviewing each others' contributions for appropriate modifications and redundancy reductions, summarizing and synthesizing what they have learned from the course readings, and reflecting on the value of their individual contributions and the value of the collection of guidelines in general.

When involved in the co-creation of a document (or any content), collaborators must determine the purpose of their work and brainstorm approaches; negotiate shared meaning and teach each other through the sharing of multiple perspectives and divergent ideas; work together to create a coherent end product; and engage in mutual peer evaluation and review. Note that these activities, required for effective document co-creation, reflect the very strategies educators can employ to enable and promote the type of dialogue and collaboration needed to support students' lifelong learning skill development. Therefore, it is through collaborating and co-creating using Web 2.0 technologies, like a wiki or Google Docs, that students can begin to learn different and more effective ways to collaborate and co-create with others and therefore, learn, unlearn, and relearn as effective lifelong learners.

Resource Sharing

Lifelong learners using Web 2.0 technologies to support their learning activities must be meta-

cognitively aware so they are able to evaluate the information they access; this involves differing levels of critical judgment and requires the ability to be both critical readers and hyper-readers (Burbules & Callister, 2000b). Critical readers have specific questions or goals in mind when accessing information online. Critical readers gather information, and select, evaluate and judge the acquired information in relation to their predetermined needs. Hyper-readers, more often than not, transform their own inquiry as they build links and connections between and among acquired information. Hyper-readers are also able to read across links, and can use links in ways that redefine, enhance or otherwise alter the information presented.

Involving students in resource sharing activities using Web 2.0 technologies can help them develop and enhance metacognitive skills associated with the critical reading and hyper-reading needed to use the Web as a source for lifelong learning. Three of the more popular Web 2.0 resource-sharing tools are:

- Flickr (http://www.flickr.com), an online photo management and sharing application;
- Slideshare (http://www.slideshare.net), an application for sharing PowerPoint presentations, Word documents, videos and zipcasts; and
- Diigo (http://www.diigo.com), a social bookmarking tool.

These three tools have similar interfaces and functionality. In cooperation and collaboration with others, people locate and/or create content that they then contribute in an organized and cross-categorized way to a common, shared forum. These shared resources are then available for use by the contributor and other participants. It is important to note that two of these applications—Flickr and Slideshare—also enable contributors to specify levels of accessibility and use, making it possible to upload content that is only available to a subset of the greater contributing community, or available to everyone. Active participation in a resource-sharing community, like those supported by Flickr, Slideshare, and Diigo, requires students to use both critical reading and hyper-reading skills. The "publicness" of students' contributions encourages them to carefully select, evaluate, and judge the content they upload for community use. Once uploaded, to fully realize the potential usefulness of the new and existing content, students must explore other uploaded resources, looking for and establishing new connections and enriching the knowledge base of resources for the community as a whole; this activity requires hyper-reading skills.

In our postsecondary online courses, we use all three of these resource-sharing tools to support the dialogue and collaboration needed to help students develop as lifelong learners. Below, we share a couple of examples of our use:

- *Presentation Prowess* project. For the *Presentation Prowess* project, our postsecondary students create a presentation slideshow that contributes something new and of value to the community of practice and is worthy of winning SlideShare's "World's Best Presentation" contest. To determine what they can create that contributes something new and of value to the community, students have to use their metacognitive skills to critically read and evaluate existing presentations. Once they have determined they have something unique to contribute, they create their presentations. Once the project is complete, students post their presentations to SlideShare (or other resource-sharing Web 2.0 tools, such as Slideboom, YouTube, Dailymotion, Prezi, or Voicethread). By posting their work publicly, students engage in dialogue with course colleagues and practitioners about their presentation via SlideShare's commenting feature. In addition, this project

involves students in contributing potential learning materials—their presentations—to the professional community of practice, supporting the larger community's pursuit of professional development via lifelong learning.

- *Design Lessons Learned* project. For this project, based on Stefan Sagmeister's *Things I Have Learned In My Life So Far* book and website (see http://thingsihavelearnedinmylife.com/ for more information), our postsecondary students reflect on what they have learned about the creative design of instructional materials during the course, requiring them to be metacognitively aware of their own learning. They then complete the follow steps:
  - Consider what you have learned about the creative design of instructional materials. What are you sure about? What do you believe now? What advice/words of wisdom do others need to know about?
  - Pick one of those design lessons learned and write it down. Design it digitally. Photograph it. Draw it. Use paint, sculpture, whatever. I don't care as long as it's interesting.
  - Post a digital photo of your creation to our Flickr group account.

Again, as with the *Presentation Prowess* project, students post their work to Flickr and then engage in dialogue with course colleagues and professional practitioners about the goal of the work, the value of the work to the community, and the effectiveness and limitations of the work. Engaging in this dialogue enhances students' metacognitive skills.

By involving students in the use of Web 2.0 resource-sharing technologies, educators can help students develop metacognitive awareness—specifically, critical reading and hyper-reading skills—within an authentic context. In addition, reflecting on the list of strategies educators can use to enable and promote dialogue and collaboration, participating in and contributing to Web 2.0-driven resource-sharing communities involves students in problem analysis (e.g., determining what content needs to be located and created, and why), teaching others (e.g., through the contribution of relevant content to the community), negotiating meaning (e.g., via the exploration of connections across and between shared content, and creating new content as a result), and peer evaluation and review (e.g., as community members, they select, evaluate, and judge the value of contributed content)—with all of these activities requiring self-directed learning and metacognitive-awareness skills that support lifelong learning. Consequently, students' use of resource-sharing and document co-creation Web 2.0 technologies for purposes of dialogue and collaboration has the potential to enhance their overall effectiveness of using the Web for lifelong learning.

Involving Students in Web 2.0-Enhanced, Intrinsically Motivating Learning Activities

Intrinsically motivated students are more likely to be lifelong learners because they have a desire and passion to learn, are willing to attempt more problems and solutions, and are focused on improving the problem-solving process (Condry & Chambers, 1978; Kinzie, 1990). Intrinsically motivated students expend more effort on tasks and activities they find inherently enjoyable and interesting, even when there are no extrinsic incentives (Keller & Burkman, 1993), making them more self-directed in their learning. As educators, we can promote intrinsically motivated learning and ultimately lifelong learning by:

- Relating learning to students' personal needs and goals;
- Placing students in authentic and decision-making roles, or roles to which they aspire;

- Having students solve professional problems of practice;
- Asking students to build products that solve problems and meet real professional needs; and
- Having learners work on and accomplish real tasks (Dunlap & Grabinger, 2003).

The foundational concept that underlies this list of strategies is relevance; if students perceive the learning activity as relevant, they are more likely to be engaged and motivated to learn (Wlodkowski, 1999).

The Web 2.0 technologies described in this chapter are widely used in the workplace and by professional communities of practice, especially by those organizations and communities that are widely distributed. Therefore, an important—and relevant—instructional goal for educators preparing students for their professions is to help students learn to use these technologies for lifelong learning, teamwork, collaboration, document and idea sharing, inquiry, and so on. We have found that our students appreciate our use of Web 2.0 technologies for academic purposes: as tools that help them (a) communicate and collaborate, (b) access and contribute to information-rich resources, and (c) solve problems and build products. Additionally, our students tend to be quite curious about how to effectively and creatively use these tools to support their professional goals and needs; their interest and, therefore, motivation to engage is evoked by the novelty of emerging Web 2.0 technologies. As Downes (2004, p. 30) shares, "The process of reading online, engaging a community, and reflecting it online is a process of bringing life into learning", and "bringing life into learning" can make learning activities personally relevant and intrinsically motivating for students, encouraging students to be self-directed and lifelong learners.

As stated at the start of this section, educators must provide students with educational opportunities to develop their capacity for self-direction, metacognitive awareness, and an overall disposition toward lifelong learning (Dunlap, 2005). To achieve this goal, educators can use the Web 2.0 technologies associated with blogging, social networking, document co-creation, and resource sharing to create intrinsically motivating learning opportunities that have the potential to help students develop the skills and dispositions needed to be effective lifelong learners. The Web 2.0 technologies described in this section have such strong potential to support lifelong learning skill and disposition development, and lifelong learning activities in general, because they have the individual and collective power to attend to the impulses of communication, construction, inquiry, and expression—the basic student interests that contribute to engagement and make learning possible (Dewey as cited in Bruce & Levin, 1997). In addition, unlike the typical LMS that is a highly bounded community (Wilson, Ludwig-Hardman, Thornam, & Dunlap, 2004), Web 2.0 technologies enable students to participate in and with their discipline's community of practice; engaging in and with the community of practice supports the development of the self-directed learning and metacognitive-awareness skills needed for lifelong learning in a much more authentic context—the context in which the students will ultimately engage in lifelong learning—than can occur behind the protected walls of a typical LMS environment.

In the next section, we share some recommendations for using Web 2.0 technologies in postsecondary settings to support lifelong learning skill and disposition development.

RECOMMENDATIONS FOR USING WEB 2.0 TECHNOLOGIES TO SUPPORT LIFELONG LEARNING SKILL AND DISPOSITION DEVELOPMENT

One thing to consider when adopting the Web 2.0 technologies described in the previous section to

support students' development of lifelong learning skills and dispositions is that they are only effective if students fully engage in their use, and use them for academic and professional pursuits. Therefore, in this section, we offer specific recommendations for using these technologies for lifelong learning skill and disposition development.

- *Select Web 2.0 technologies based on learning objectives, not because they are cool.* In other words, let pedagogy rather than technology dictate whether or not to use a certain Web 2.0 technology. Every month or two a new (and often very "cool") Web 2.0 technology is developed. And while it is easy to get wrapped up in the newest and greatest technology, it is important to focus on technologies that support the learning objectives. Further, quality is more important than quantity; it is often more beneficial to meaningfully integrate one Web 2.0 technology into a course than to superficially integrate a number of different technologies.
- *Establish relevance for students.* Students need to see the relevance of using these new Web 2.0 technologies both within their studies and beyond. This can often be accomplished by demonstrating how your own personal learning network (PLN) supports your learning, professional development, inquiry, and so on. Often it is helpful to recommend to students a list of professionals they can follow, blogs they can read, and networks they can join. Students also benefit from seeing examples of how people use these tools to establish their expertise—that is, become known—as well as how future employers use these tools. Finally, building Web 2.0-derived results into assessments can also help establish relevance for students.
- *Define clear expectations for participation.* Web 2.0 technologies and the participatory culture that they engender are often at odds with students' traditional concepts of education and schooling. It is extremely important to clearly define expectations for participation. This includes not only addressing the public and private dimensions of many of these technologies, but also clearly explaining the differences between social/personal vs. academic/professional uses of these technologies. For instance, are you comfortable befriending your students in Facebook? Are they comfortable befriending you? Regardless of the answers to these questions, it is important to clearly address these issues and give students the option of establishing a new avatar (e.g., online identity) instead of allowing access to their own (or your own) strictly social/personal accounts.
- *Model effective Web 2.0 technology use.* We often assume that students know how to effectively use these Web 2.0 technologies. And while this might be true to a degree, students often use many of these technologies in different ways in their personal life than they might be expected to use for class. Therefore, if you are going to ask students to use specific tools for a course, it is helpful to have already established your own personal record of use so that you can model best practices for achieving the learning objectives (in this case, lifelong learning skill and disposition development).

Finally, educators must recognize the limitations and possible drawbacks of using these new Web 2.0 technologies. For instance, using Web 2.0 technologies, like the one's discussed in this chapter, inevitably pushes student learning and the online classroom outside of the LMS. Even though some educators are attracted to a do-it-yourself approach to online learning that does not attempt to contain (or constrain) all learning

within a LMS (see Wikipedia for more information on the Edupunk movement, http://en.wikipedia.org/wiki/Edupunk), the majority of educators (or at least administrators) appear to value the affordances provided (e.g., the ability to keep a record of everything) by the mainstream trend of keeping online learning nice and neat behind the lock and key of the LMS. Using Web 2.0 technologies also typically requires students to set up multiple accounts to be able to use different Web 2.0 tools and applications. In our experience, while the majority of students do not mind (and many already have accounts), there are sometimes a few students who resist setting up another account, with another username and password. Faculty should also keep in mind that Web 2.0 technologies come and go; a technology used one semester might not be available (e.g., because the company went out of business or changed its pricing model) the next semester. Finally, the possible "publicness" and digital foot-print of many of these tools also needs to be considered (for more on publicness, see Lowenthal & Thomas, 2010).

FUTURE DIRECTIONS AND CONCLUSION

Web 2.0 technologies and the participatory culture they encourage are relatively new. Educators have only recently begun to experiment with these different tools—specifically, blogs, mirco-sharing, social networking, document co-creation and resource sharing. There are two main things educators and researchers alike must begin to do. First, while many of us have had positive experiences using these new Web 2.0 technologies, it is time to begin researching the efficacy of using these new tools in our courses. Projects such as APT STAIRS are starting to attend to this need; APT STAIRS is a project aimed at helping different audiences (e.g., academics, students, and researchers) use collaborative Web 2.0 tools like Google Docs to enhance collaborative working practices (see http://sites.google.com/a/jiscapt.net/project-plan/Home for more information). Further, we must begin experimenting with different ways of using these tools to meet educational goals with different learning audiences, and formally evaluate the effectiveness of bringing these tools into our courses; our use of these technologies has been with postsecondary students, most of who are digital immigrants in graduate-level programs, so inquiry into the use of Web 2.0 technologies to support the lifelong learning skill and disposition development of other audiences—including investigation into the differences between digital natives and digital immigrants—is needed. Secondly, postsecondary educators find themselves in a time where they are expected to do more with less. Many find it difficult enough to teach online and to use the standard LMS. Therefore, educators need targeted faculty development that helps them not only understand how many of these new technologies work but how and why they might use them in their courses to support specific learning objectives and overall student engagement. By taking these steps, postsecondary educators and the university as a whole can more effectively address the challenges mentioned at the start of this chapter.

Web 2.0 technologies are making possible "new kinds of open participatory learning ecosystems that will support active, passion-based learning: Learning 2.0" (Brown & Adler, 2008, p. 32). Brown and Adler go on to predict that Web 2.0-enriched learning environments may "encourage students to readily and happily pick up new knowledge and skills as the world shifts beneath them" (p. 32), enabling them—as lifelong learners—to meet the ever-changing needs and demands of their workplace and profession. In this chapter we have shared our ideas for using the Web 2.0 technologies associated with blogging, social networking, document co-creation, and resource sharing to create intrinsically motivating learning opportunities—Learning 2.0 opportunities—that have the potential to help students develop the

skills and dispositions needed to be effective lifelong learners. Specifically, educators can use these technologies to help students develop autonomy, responsibility, and intentionality; encourage student reflection; enculturate students into a community of practice; and enjoin students to participate in discourse and collaboration. These fundamental skills are needed to engage in the self-directed learning and metacognitive processing that is at the heart of effective lifelong learning.

There is little doubt in our minds that current and yet-to-be-realized Web 2.0 technologies and tools can be used by postsecondary educators to support student learning in powerful and meaningful ways, while at the same time address head-on the emerging trends and challenges facing postsecondary education today. To realize the potential of Learning 2.0, we as postsecondary educators need to continue our exploration of Web 2.0 technologies for teaching and learning, discovering new ways these tools can help us achieve our instructional goals and objectives; and, in the process, help students develop the mandatory skills that will enable them to perpetually learn, unlearn, and relearn as the world shifts beneath them.

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